EVALUATION OF THE EPIDEMIOLOGY AND PATTERN OF INTESTINAL OBSTRUCTION, ITS MANAGEMENT AND COMPLICATIONS

Dissertation Submitted in partial fulfillment for the degree of

M.S GENERAL SURGERY

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CHENNAI - TAMILNADU

DECLARATION

I solemnly declare that this dissertation was prepared by me at Chengalpattu Medical College , under the guidance and supervision of **Prof. DR.G.RAJA BILLYGRAHAM M.S** Prof and HOD of General Surgery Chengalpattu Medical College, Chengalpattu. This dissertation is submitted to the Tamilnadu Dr.M.G.R Medical University Chennai in partial fulfillment of the university regulation for the award of degree of M.S., General Surgery

Place

Date Dr.S.Jim Jebakumar

CERTIFICATE

This is to certify that **Dr.S.JIM JEBAKUMAR** postgraduate student (2007-2010) in the department of General Surgery, Chengalpattu Medical college, Chengalpattu has done this dissertation titled

" Evaluation of the epidemiology and the pattern of intestinal obstruction its management and its complications "

under the direct guidance and supervision in partial fulfillment of the regulations laid down by the Tamilnadu Dr.M.G.R. medical university, Chennai, for M.S., Branch – I General Surgery degree examination.

UNIT CHIEF
Dept. of General Surgery
Chengalpattu medical College

PROFESSOR AND HOD
Dept. of General Surgery
Chengalpattu Medical College

DEAN

CHENGALPATTU MEDICAL COLLEGE
& HOSPITAL, CHENGALPATTU

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CONTENTS

INTRODUCTION

Intestinal obstruction is a major cause of morbidity among the surgical cases all around the world. Dynamic intestinal obstruction forms the most important cause when comparing to the adynamic obstruction.

In developed countries , the most important cause of intestinal obstruction is the post operative adhesions whereas the obstructed inguinal hernias forms the most important cause of intestinal obstruction in the developing countries. The painless inguinal swelling is often ignored and the considerable delay in atteneding this problem usually lands up in emergency surgery. A few patients are benefited by obstruction release alone while many of the patients need resection and anastomosis.

The purpose of this study was to determine the various etiologies, the pattern of intestinal obstruction in our setup.

This study also analyses the various modalities of treatments available and the post operative complications.

ELIGIBILITY CRITERIA

All patients of non pediatric age group who were diagnosed as intestinal obstruction and undergone emergency surgery were taken and analysed. This was an analytical study with prospective data of 50 cases of intestinal obstruction collected from all surgical units of Chengalpattu Medical College Hospital from July 2007 to October 2009.

Patients who were treated conservatively & relieved were excluded from the study. Similarly patients presenting with intestinal obstruction due to obstructed inguinal hernia with no evidence of strangulation that reduced spontaneously were also excluded.

AIMS OF STUDY :

1. To study the incidence of intestinal obstruction due to mechanical causes, in the cases admitted in Chengalpattu Medical College during the period.
2. To study the relative incidence of the various causes of intestinal obstruction
3. To find out various etiological factors.
4. To note the clinical presentation of various types of intestinal obstruction.
5. To study the various line of management adopted.
6. To study the prognosis, morbidity and mortality of the various causes.

MATERIALS AND METHODS :

1. Patients admitted in the surgical wards with intestinal obstruction at Chengalpattu Medical College between July 2007 and October 2009 forms the material of this study.
2. Case sheets, and investigational reports of the above said patients also form the material.
3. Clinical examination, biochemical and radiological investigations, surgical methods and follow up are the methods.

This is a prospective study, which comprises of 50 patients, treated for intestinal obstruction, from July 2007 – October2009 at Chengalpattu Medical College.

The patients on admission were subjected to thorough physical examination and available investigation, they were treated with IV fluids, antibiotics and blood transfusion when required in the pre and post operation period and were subjected to appropriate surgical procedure.

The post operative period was monitored for complications. After discharge an attempt was made to follow up the case.Patients who underwent colostomy were followed till the bowel continuity was restored.

REVIEW OF LITERATURE :

INTESTINAL OBSTRUCTION :

Definition:

Intestinal Obstruction is defined as a failure in the downward passage of intestinal contents due to either a mechanical occlusion or from a fault of propulsive mechanism.

Usually,we arrange Intestinal Obstruction in 3 groups.Simple Occlusion,Strangulation,and Neurogenic obstruction.But these three may be present in varying amounts in all cases of obstruction.

Classification:

Intestinal Obstruction can be classified on the basis of types, site of obstruction mechanism involved.

1.Nature of the lesion causing the obstruction

a. Mechanical/ Dynamic

b. Neurogenic / Adynamic / Paralytic ileus.

2. Level of obstruction

a.High gut – proximal small intestine

b.Mid gut - distal small intestine

c.Low gut - colonic

3.Types of obstruction

a.Simple occlusion of lumen

b.Strangulation

4.Clinical classification

a.Acute

b.Sub Acute

c.Chronic

d.Acute on chronic

Acute obstruction

Usually seen in small bowel obstruction

Clinical features :

- Central colicky abdominal pain
- Early vomiting
- Central abdominal distension
- constipation

Chronic obstruction

Mainly seen in large bowel obstruction

Clinical features :

- abdominal distension
- colicky pain
- progressive constipation

Acute on chronic obstruction

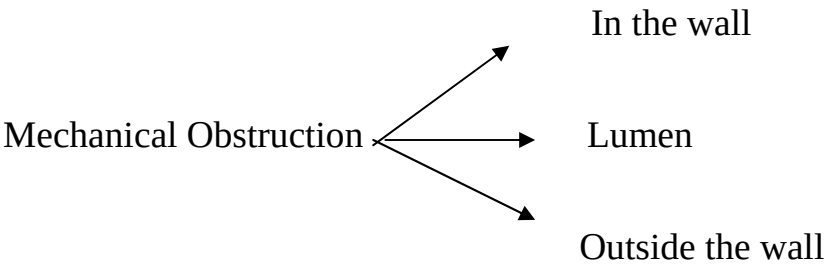
Spreads from large bowel to involve small bowel and gives rise to pain and constipation of a variable time followed by abdominal distension and vomiting.

Closed loop obstruction

When afferent and efferent limbs of a loop of bowel are obstructed, closed loop intestinal obstruction occurs.

This is clinically dangerous form of obstruction because of the propensity for rapid progression to strangulation of blood supply before the usual manifestation of intestinal obstruction become obvious.

It's typically seen in carcinomatous stricture of the colon. Distally the colon is occluded by the neoplasm, while in one third of cases the ileo caecal valve prevents regurgitation of contents of the large intestine into ileum and consequently that part of colon proximal to the neoplasm is closed at both end. As a result of anti peristalsis the pressure within the caecum becomes so high to compress the blood vessels within it's wall. If the obstruction is unrelieved, stercoral ulceration, gangrene and pistol shot perforation of caecum will eventually occur.



In the lumen

1. Meconium
2. Intussuception
3. Gall Stone
4. Impaction

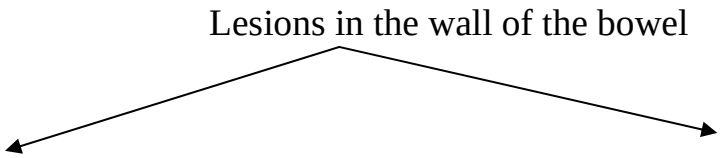
a.Feces

b.Barium

c.Worms

d.foreign body

e.Bezoar



Congenital

1.Atresia /Stenosis

2. cong.bands

3.Malrotation

4.meckels diverticulum

Acquired

1.Inflammatory

a. Regional enteritis

b.Diverticulitis

c.ulcerative colitis

2.Vascular

3.Neoplastic

a.Benign tumors

b.malignant tumors

4.Adhesive bands

5. Miscellaneous

a.Radiation induced

b.Post ischemic stricture

c.Stomal edema/stricture

Extra Intestinal causes :

1. Abscess, hemaotomas
2. Tumors in adjacent organs or lymphnodes
3. annular Pancreas
4. Superior mesenteric artery syndrome
5. External hernias
6. Internal hernias

Neuromuscular defects

I Mega Colon

II Paralytic ileus

a.Abdominal cause:

---*Peritonitis*

---*Retroperitoneal lesions*

---*Tense ascites*

b.Systemic cause :

---Electrolyte imbalance (Hypokalemia)

--- Toxemia

c.Othercauses :

b.Spinal Cord Lesion

c.Head Injury

d.Fracture Pelvis

e.Pueumonia

Events in intestinal obstruction :

Initially due to the stretch reflex increased peristalsis occurs in the proximal intestine until it ceases and the obstructed intestine become fatigued and dilates with contractions becoming less frequent and less intense. This cessation has a protective effect in preventing vascular damage due to increasing intra luminal pressure. Unless the obstruction is relieved ischemic necrosis of bowel wall ensues.

Distension is due to

- Gas
- Fluid

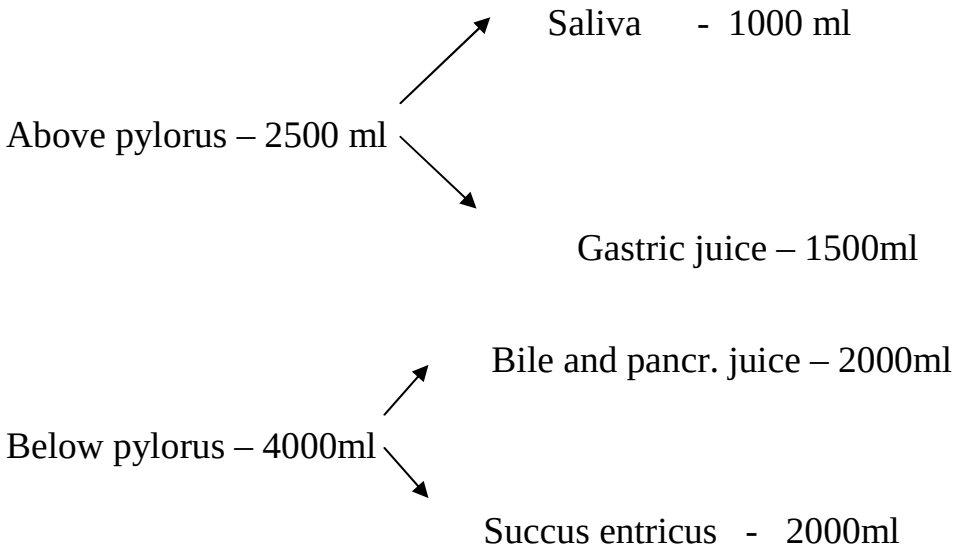
Gas

- Swallowed air - 68%
- Diffusion from bowel lumen - 22%
- Products of digestion and Bacterial activity - 10%

Fluid

- Ingested fluid before surgery
- Digestive juices

Normally about 6000- 8000 ml is secreted in 24 hours.



As the bowel dilates water and electrolytes accumulate both intraluminally and in the bowel wall itself. This massive 3rd space fluid loss accounts for the dehydration and hypovolemia.

Effects of bowel distension

1. Respiration

The diaphragm is pushed up into the chest and moves inadequately. Ventilation becomes shallow and compression of lung bases may cause right to left shunt. Oxygen tension is reduced. Hypoxia and possibly hyper carbia and acidosis from under ventilation contribute to multiple organ failure.

2. Gut flora

Normal gut bacterial flora helps in several physiological processes

- Degradation of bile pigments
- Degradation of several toxic products
- Vitamin K production
- Alteration of colonic motility and absorption

Intestinal obstruction results in mucosal ischaemia especially when there is strangulation and gangrene. This results in trans migration of bacteria from lumen to systemic circulation as well as absorption of potentially lethal metabolic products of bacteria leading to Systemic Inflammatory Response Syndrome (SIRS) and MultiOrgan Dysfunction Syndrome (MODS) .

3.Blood supply to bowel

The blood supply is impaired by internal compression or by interruption of mesenteric blood flow or by rising intra luminal pressure as in closed loop obstruction.

In such circumstances the venous return is affected before the arterial supply leading to increased capillary pressure. This leads to escape of intra vascular fluid and diapedesis of RBC into the bowel wall, lumen and peritoneal

cavity leading to hemorrhagic infarction and loss of blood volume proportional to the length of the bowel affected.

In mesenteric artery thrombosis the arterial supply is directly compromised.

Clinical Manifestation depends on the following factors :

1.Level of obstruction (High or Low)

2.Blood supply to bowel wall

3.Length of obstructed loop

4.Acuteness and completeness of obstruction

Clinical Manifestation

Intestinal obstruction is charaterised by

- Abdominal pain
- Distension of the abdomen
- Vomiting
- Constipation

Pain:

Pain in intestinal obstruction is typically crampy, with paroxysms occurring at 4- 5 min intervals in proximal obstruction and less frequently in distal obstruction.

In between attacks the patient is often quite comfortable.After a prolonged period, the colicky pain subside, due to paralytic ieus.When the intermittent colicky pain is replaced by continuous severe abdominal pain shangulation with peritonitis must be suspected.

Vomiting:

In the initial stages, consists of partially digested food and gastric juice.In the later stages bite stained fluid is brought out finally it becomes feculent.This is due to proliferation of bacteria in the stagnant fluid.Copious vomiting is seen in high gut obstruction and less frequent vomiting in distal obstruction.

Distension:

Proximally occlusion of jejunum leads to distension of stomach with gas and accumulated secretion so as to produce a fullness in the epigastric region. Ileal obstruction produces central abdominal distension and distally colonic obstruction produces universal distension of abdomen with bulging flanks . Volvulus generally produces massive distension.

Constipation:

In complete intestinal obstruction , after the contents of thebowels below the obstruction have been exahausted, constipation occurs, and usually neither

feces nor flatus is passed (i.e) absolute constipation. Even though common,constipation is an unreliable sign of obstruction.

Richters hernia,intussusception, gall stone ileus,mesenteric vascular occlusion,and intestinal obstruction associated with pelvic abscess may not produce constipation.

Dehydration:

Repeated vomiting leads to dehydration with a dry skin, dry tongue and sunken eyes. Urine is concentrated and volume is low. Blood urea and PCV are elevated.

Physical examination:

In general examination PR ,BP and respiratory rate should be charted.The patient in colic will be restless , in contrast to the stillness of a patient with peritonitis. VIP should be looked for.

Femoral and inguinal hernia orifices should be looked for carefully. Tenderness, rebound tenderness and muscle guarding will be present in a patient with strangulation.A mass may be felt in carcinoma colon, diverticulitis, and intussuseption. In mechanical obstruction bowel sounds are increased and borborygmi may be heard. On aucultation, loud splashing, rushing or tingling sounds can be heard. A silent abdomen suggests either paralytic ileus or infarction

Visible Intestinal Peristalsis

of the bowel. The presence of an abdominal scar whether recent or old suggests an underlying adhesion.

Per rectal examination:

Should be routinely done in all cases of intestinal obstruction. The paients with chronic constipation, impacted fecal matter will be felt.In carcinoma rectum there may be proliferative growth which could occlude the lumen. A blood stained finger stall is suggestive of intussuception. Ballooning of rectum is suggestive of high obstruction. It can also be seen following a soap and water enema and also in obstruction of the urinary tract.

Investigations

Plain X ray abdomen

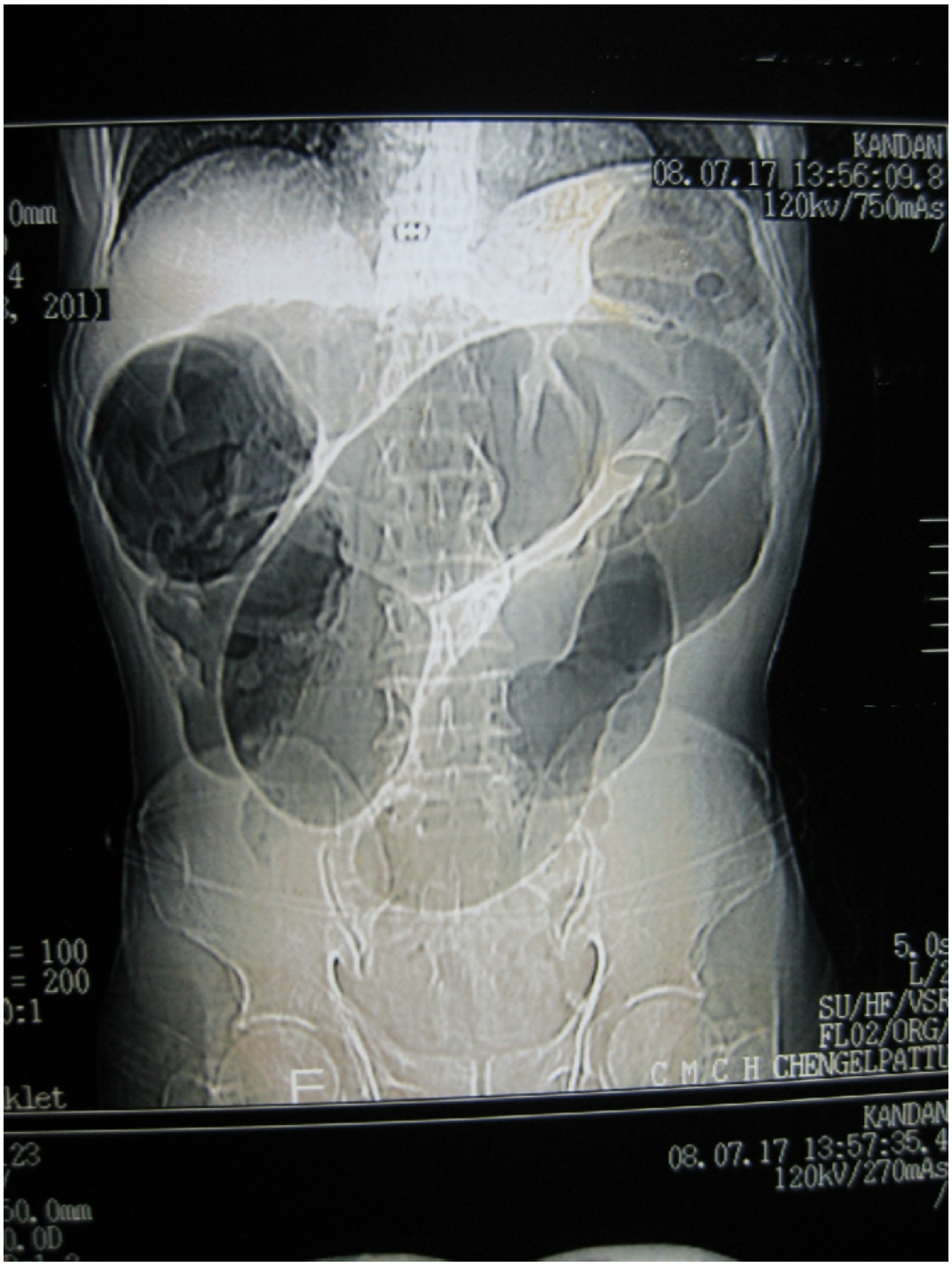
The following findings should be noted

Gas shadows :

Obstruction of small bowel is characterized by relatively straight loops that lie more or less transversely in step ladder pattern

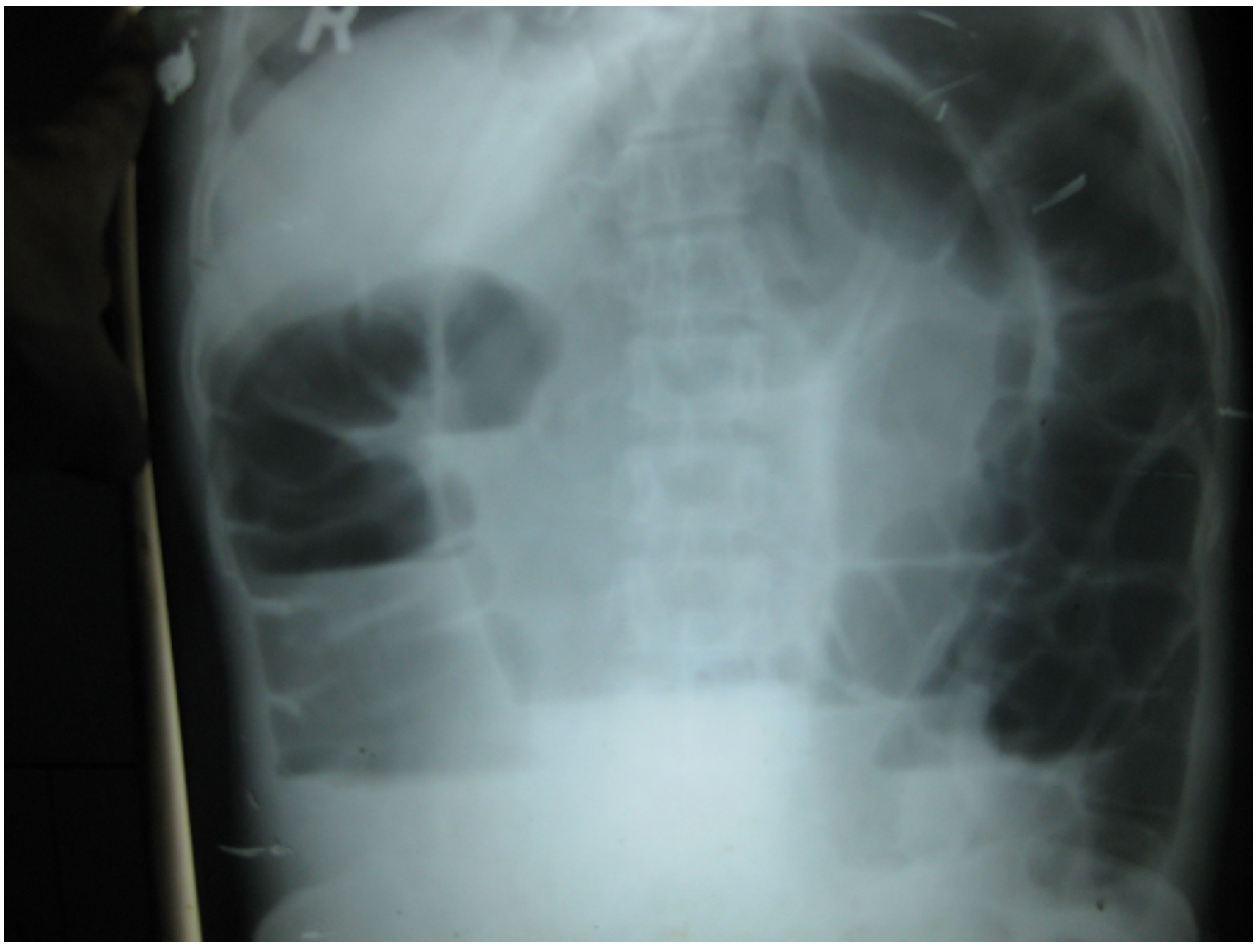
Obstructed large intestine is revealed by haustrations which are spaced irregularly not occupying the complete width of the bowel and the indentations are not placed opposite one another . The distended cecum is shown by a rounded gas shadow.

Sigmoid Volvulus

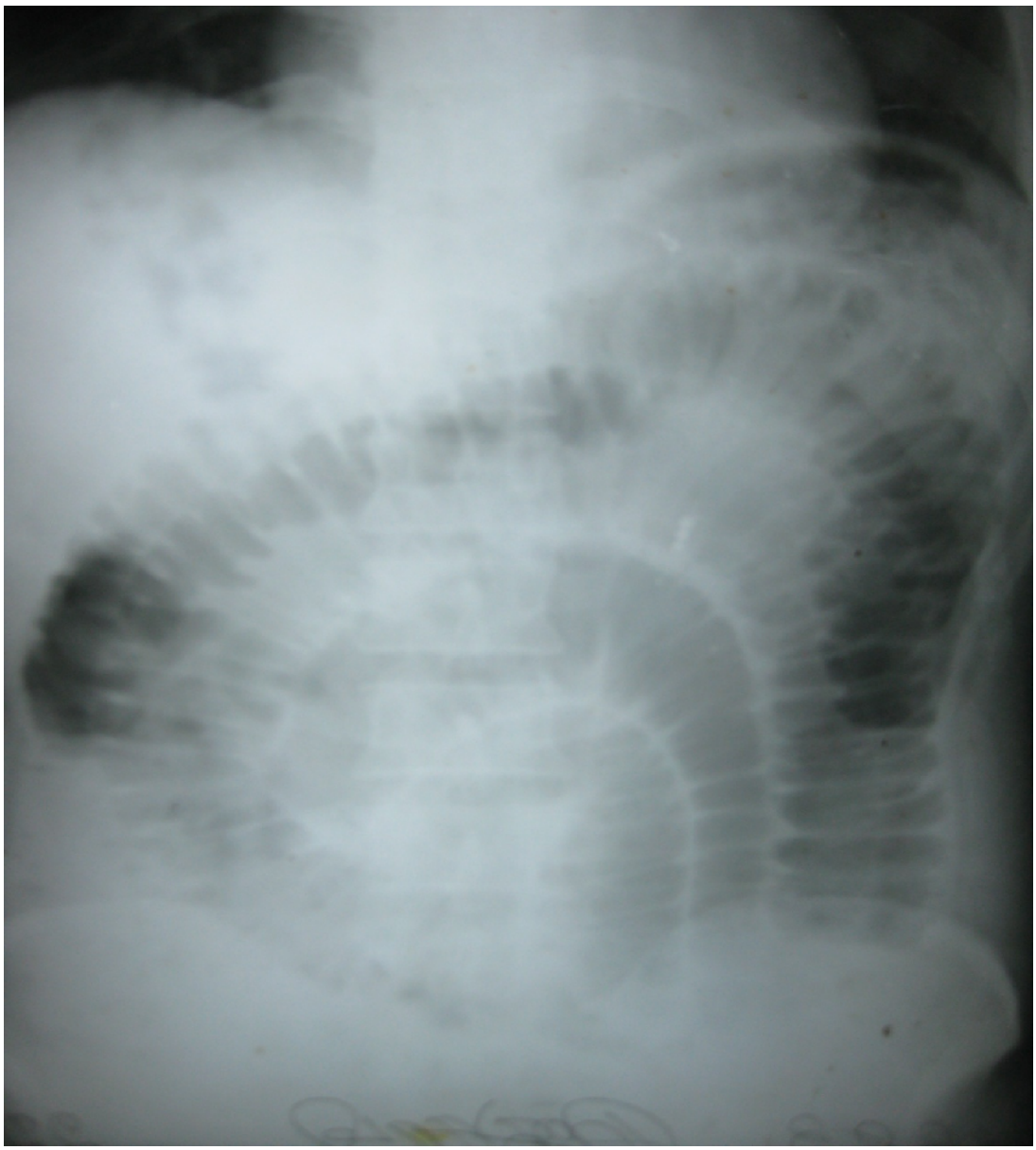


Coffee Bean Appearance

Dilated large Bowel



Small bowel Obstruction



Jejunum is characterized by its valvulae conniventes which are spaced regularly from the antimesenteric to mesenteric border. The ileum is characterless .

In volvulus of the sigmoid colon a tremendously dilated sigmoid loop may be seen which could extend up to the diaphragm and may even fill right side of the abdomen (coffee bean sign,bent inner tube appearance)

Fluid levels :

In infants under the age of 2 years , a few fluid levels in the small intestine are normal. In the adult three fluid levels are sometimes seen which are considered normal. They are present in the gastric fundus ,the duodenal cap and terminal ileum.

In intestinal obstruction it takes a little time for the gas to separate from the fluid. Consequently fluid levels appear later than gas shadows. When paralysis of intestine has occurred ,fluid levels become more conspicuous and more numerous. The number of fluid levels is proportionate to degree of obstruction and the site of obstruction

Radiological changes of the bowel in intestinal obstruction takes 4-6 hrs to develop.

CT Scan :

The following parameters can be determined from the CT Scan

1. Bowel wall thickening
2. Soft tissue edema associated with inflammation or infection
3. Abnormal fluid collection
4. Intramural or extra intestinal gas
5. Any growth arising from the bowel
6. Abnormalities in the retroperitoneum and other organs

Advantages of CT Scan

1. It provides more information than the plain Xray regarding the cause of obstruction
2. It is more helpful in identifying the unusual cause of obstruction like internal hernias ,malignant masses
3. It provides more information to determine the presence or absence of strangulation
4. it is much more likely to suggest an alternative diagnosis if obstruction is not present

5.nodal metastasis, liver metastasis and ascites can be identified and it helps to look for primary lesion in the large bowel and identify the cause of obstruction

6.it differentiates organic obstruction from adynamic ileus

USG

Abdominal USG can aid the diagnosis of obstruction and identify its location and etiology. Real time USG which can examine the blood flow can aid the diagnosis of strangulated obstruction where its accuracy may be around 80- 90%.

Paracentesis:

Not of much use, but a dark blood stained fluid, if obtained suggests strangulated obstruction.

Laparoscopy:

Can explain the nature of an acute abdominal syndrome associated with signs of ileus, by disclosing the presence of adhesions and dilatation of the cephalad portion of the intestine. The viability of the bowel due to volvulus can be assessed.

A significant laparoscopic finding is hemorrhagic infarction due to acute or sub acute obstruction of the mesenteric blood vessels.

Differential diagnosis

Conditions that mimic intestinal obstruction include inflammatory conditions like

1.Cholecystitis

2.diverticulitis

3.Acute Pancreatitis

4.Appendicitis

Acute intermittent porphyria, lead colic, sickle cell anemia also mimic intestinal obstruction; In case of strangulated bowel perforation causing peritonitis, the accurate diagnosis may be difficult.

Methods of treatment:

Must be started as soon as the diagnosis is made . Aims of the treatment are

1.adequate decompression, so as to reduce the intra luminal pressure

2.restoration of the normal bowel function by relieving the obstruction

3.replacement of fluid and electrolytes

4.antibiotics to prevent complications from infection

Intestinal obstruction generally requires surgical intervention, because it is not possible to distinguish between simple and strangulated obstruction.

In early post operative and recurrent obstruction, due to adhesion and in partial large intestinal obstruction, a period of conservative management can be tried.

The aspiration of gastric contents relieve nausea. Bowel decompression is the hallmark in the management of intestinal obstruction.

During the period of conservative treatment a careful monitoring of clinical and radiological parameters is essential.

Fluid and electrolyte balance:

Fluid balance charts, daily serum and urine biochemical estimations are essential for calculation of exact fluid requirements. Adequate amount of Na+, K+ and glucose must be given. Fluid loss to be replaced with ringer lactate.

Blood and plasma:

Intussusception, volvulus and intestinal strangulation produce loss of blood and this must be replaced. Small intestinal obstruction produces loss of plasma and this must be ideally managed by plasma transfusion.

Surgical treatment :

The indications for surgical intervention are

1.failure of conservative treatment

2.established strangulation

3.mechanical obstruction

4.acute colonic obstruction

pre operative preparations with nasogastric decompression, intravenous fluids, antibiotics, estimation of Hb%, PCV, blood group, and blood urea, serum creatinine ,electrolytes are essential. Systemic disease like diabetes mellitus must be looked for.

Specific operations

1.exploratory laprotomy for obstruction of uncertain origin

2.external drainage by colostomy , caecostomy or enterostomy proximal to the obstruction.

3.ileocolic or entero enteric anastomosis for bypass

4.resection of bowel, either to remove an obstructing lesion like Ca colon or because of irreversible vascular changes

5.Lysis of bands and adhesions.

Exploratory laparotomy

The primary aim of the surgery should be to save life by the simplest procedure. The cause of obstruction should be discovered and dealt with and the state of viability of the bowel to be looked for.

The abdomen should be explored through a midline incision. On opening the peritoneal cavity the bowel which is collapsed should be looked for to know the level of obstruction. For example If the caecum is collapsed, it indicates small bowel obstruction, if it is distended, the obstruction will be in the large bowel. If

the ileum is collapsed the obstruction will be in the jejenum. The lesion is situated at the point and should be dealt with. If it is considered inadvisable to remove the lesion, a one stage by pass procedure can be performed. If the small bowel is grossly distended, it should be decompressed by means of tube suction or by enterotomy and suction drainage .

Prognosis:

The major factors deciding survival rate in intestinal obstruction are

1. Time of onset of obstruction. Longer the duration worst the prognosis
2. Level of obstruction
3. Obstruction associated with complications (gangrene, perforation)
4. gross fluid and electrolyte imbalance
5. Age of the patient , older the age mortality is higher

ADHESIVE OBSTRUCTION

Solitary band or adhesions are the most common cause of intestinal obstruction. Adhesions could be either congenital or acquired. Congenital adhesions rarely cause any trouble and those giving rise to intestinal obstruction are almost always post operative or following diffuse intraperitoneal inflammation. Appendicectomy and gynaecological operations figure prominently in statistical analysis of post

operative adhesions. Abdomino perineal resection of the rectum and total colectomy have also got a high incidence of post operative adhesions.

Post operative adhesions usually implicate small intestine especially ileum.

Etiology of adhesion:

Peritoneal irritation, from whatever cause results in the outpouring of fibrin which produced adhesions between opposed peritoneal surfaces. This can either undergo resolution or get organized by the in growth of fibroblast to form fibrous adhesions.

Causes of adhesions :

1	Ischemic areas	Site of anastomosis, reperitonealisation of raw area
2	Foreign bodies	Talc, starch granules, gauze,cellulose,non absorbable sutures .
3	Infective disease	Peritonitis,tuberculosis
4	Inflammatory disease	Crohn's disease
5	Radiation enteritis	Following radiotherapy
6	Sclerosing peritonitis	Usually drug induced practalol or other beta blockers.

Adhesions are useful in preventing an ischemic appendix or gall bladder from rupturing into the general peritoneal cavity or in preserving the viability of the anastomoses, and also in reinforcing the integrity of a traumatized section of intestine.

Generally the fibrin strands are present ,localized to those areas, where intense tissue anoxia has occurred. Ischemic tissue inhibit fibrinolysis (have a high plasminogen activity) by normal tissues.

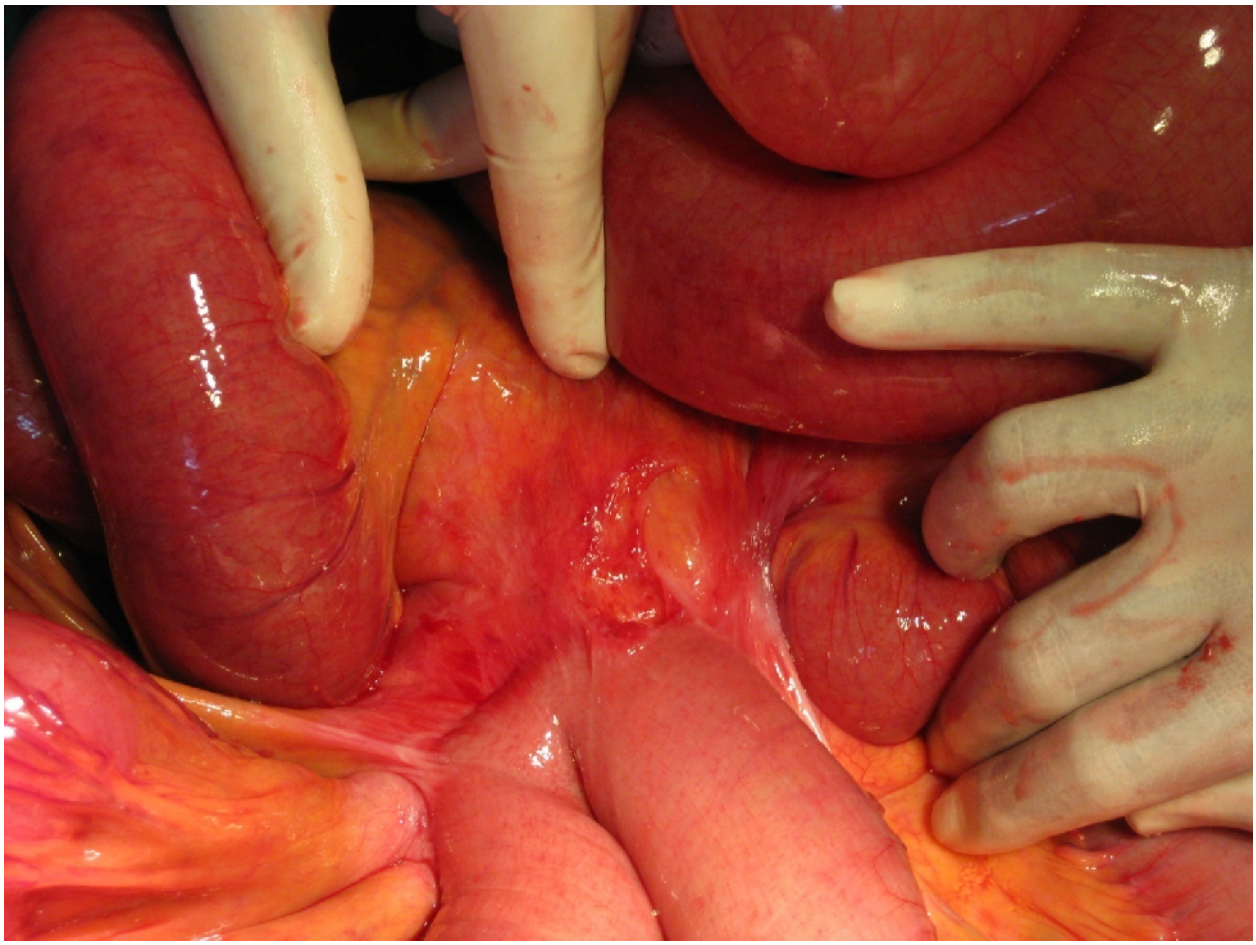
Practically possible simple techniques in prophylaxis against adhesions include

1. Delicate handling of tissues and organs
2. Avoidance of spillage of visceral contents during surgery
3. Minimizing operative blood loss.
4. Avoidance of closure of parietal peritoneal defects.
5. Washing the operative region and peritoneal cavity with isotonic saline at the end of the operation.

Meticulous surgical techniques should be aimed at, and must include the prevention of granuloma formation from foreign materials.

Peritoneal defects must be left open, rather than being pulled together under tension. Another technique of preventing adhesion in the small bowel is to draw the omentum over other abdominal viscera, before closing the incision and

Adhesive Intestinal Obstruction



especially over an anastomotic site. If the omentum is not available, falciform ligament or the broad ligment in the female can be used.

Treatment:

Initial management is conservative . If the patient is treated successfully by conservative measures , regular assessment is mandatory .

When the conservative measures failed , laparotomy is required. The adhesion which causes obstruction should be idenfified and divided by sharp dissection. To prevent recurrence the bare area should be covered with omental grafts. The remaining adhesions are left as such unless severe angulation is present. Division of these adhesions will only cause further adhesion formation.

When the intestinal obstruction is recurrent due to adhesions several procedures like

1. Repeat adhesiolysis
2. Noble's plication
3. Charles- Phillips transmesenteric placation
4. Intestinal intubation may be considered

OBSTRUCTED GROIN HERNIA:

External hernias are one of the most common causes. It is simple to diagnose, provided the hernial orifices are examined meticulously. Obstructed hernias can result in strangulation. Inguinal hernias are four times more common than femoral hernia, but the later is more likely to get strangulated. Umbilical, incisional ,lumbar, spigelion, obturator and sciatic hernias can also undergo complications. Vigorous attempt at reduction of an obstructed hernia must be avoided.

Management:

Early surgery is advisable. The sac should be opened. Toxic fluid let out and the constricting ring divided. The viability of the bowel should be assessed and if doubtful or already gangrenous, resection of the involved portion and end to end anastomosis must be done . A separate abdominal incision is better, since the viability of the rest of the bowel can be assessed without undue manipulation and traction of the bowel. A posterior wall repair is also essential . The combined approach is better in cases of strangulated femoral hernias.

VOLVULUS

Results from axial rotation of a portion of the alimentary tract. It can occur in the sigmoid colon, caecum and small bowel . volvulus of transverse colon is rare.

Predisposing factors:

1. Band of adhesion
2. Overloaded pelvic colon- contributed by high vegetable and fibre diet
3. Long pelvic mesocolon
4. Narrow attachment of pelvic mesocolon

Sigmoid volvulus :

Occurs most commonly in the elderly people. There are 2 forms of disease.

1.acute fulminating type – seen in young individuals with a sudden onset, rapid course, early vomiting rapid deterioration with gangrene

2.subacute progressive form- seen in older people with insidious onset , recurrent benign course ; gangrene is slow to develop

Sigmoid volvulus occurs when the bowel twists on its mesenteric axis, from one half to two turns in anticlockwise direction

Radiology :

The bent inner tube sign in a plain x ray is typical of sigmoid volvulus. The other signs are inverted coffee bean sign, Friedman Dahl sign, bird beak sign . The tremendously distended sigmoid loop may be seen with 2 fluid levels one on the

proximal and the other on the distal limb of the obstructed loop. In advanced cases the right colon may be distended with gas and if the ileocecal valve is incompetent , small intestinal fluid levels are also seen.

Treatment :

1. To relieve the torsion
2. To prevent the recurrence

Conservative management :

Spontaneous untwisting is possible by a simple enema or a barium enema . Passage of a well lubricated soft flatus tube through a sigmoidoscope and positioning it high as possible may relieve the obstruction. The tube must be left in position for 48 hours . Colonoscope can also be used for detorsion of sigmoid volvulus , the advantage being that the mucosa can be inspected and the viability confirmed

Operative management :

Indicated when conservative treatment fails or strangulation has supervened or electively to prevent recurrence. Decompression followed by resection and end to end anastomosis is the ideal treatment. Laparoscopic fixation of a recurrent sigmoid volvulus has been done nowadays.

Sigmoid Volvulus

Caecal volvulus :

The caecum usually moves upwards and to the left. It may involve the terminal ileum, ascending colon and sometimes transverse colon also. The twist can vary from 90 degree to 3 complete turns. Predisposing factors include previous abdominal operations, peritonitis and adhesion formation. Pregnancy, cysts, pelvic tumors can also push the caecum up. It is better to avoid excessive manipulation of the caecum at surgery to avoid development of caecal volvulus later on.

Clinical Features :

The age group affected is usually 5^{th} - 6^{th} decade. It usually presents as colicky abdominal pain in the right lower quadrant, distension, vomiting and absolute constipation. A tymphanitic mass may be found in the RIF, which can flip over to the left side of the abdomen

Radiology :

The characteristic features are

1. An enormously distended caecum
2. Dilated loops of small intestine located to the right of the caecal gas shadow
3. Evidence of small bowel obstruction.

4. Presence of single fluid level in the caecum compared to 2 fluid levels in sigmoid volvulus.

Treatment:

Operative treatment is mandatory. Colonoscopic detorsion has been tried but with little success. If detorsion is possible and the bowel is viable reduction with caecopexy is done. If reduction is impossible or the bowel is gangrenous then the choice is right hemicolectomy. Recurrence is common after caecopexy.

VOLVULUS OF THE SMALL INTESTINE :

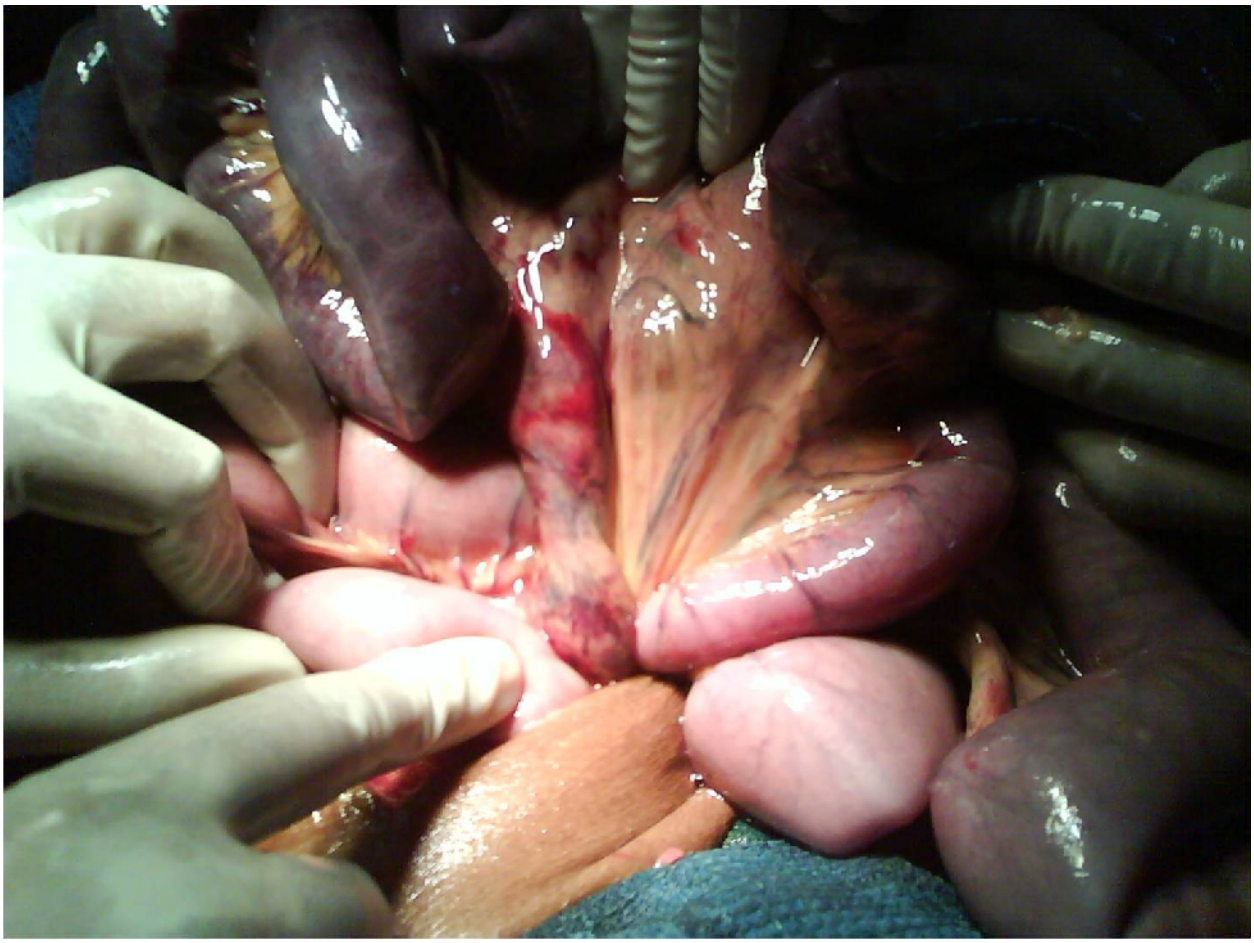
Volvulus of the small intestine occurs at any age. Primary type occurs in children and young adults and secondary type in 6^{th} 7^{th} and 8^{th} decade. Most patients present in the 1^{st} month of life.

Types of small bowel volvulus :

Primary

- Occurs in normal abdomen with no underlying anomalies
- May be associated with dietary habits

Small Bowel Volvulus



Secondary

- Associated with anatomic malformations (i.e)mid gut non rotations, tension bands, postop. Adhesions

Predisposing factors :

- Excessive length of mesentery
- Abnormal intestinal peristalsis
- Segmental bowel distension

The clinical features are that of small bowel obstruction. In complete obstruction rapid intestinal ischemia , signs of peritonitis and hypovolumic shock may be present. X ray films show distended bowel, air fluid levels or both.

Management : includes simple derotation, resection of the gangrenous bowel, followed by enterostomy or primary anastomosis.

TUMORS :

Left sided colonic growths can present with acute intestinal obstruction due to the annular type of growth and due to the solid nature of faeces.Small bowel lymphomas are increasing in incidence and can manifest as acute intestinal obstruction. Right sided tumors (caecum , Ascending colon) can present with obstructive features. Ca caecum can be the apex of an intussusception, presenting

with intermittent obstruction. However the common mode of presentation of right sided tumors is mass in RIF, and anemia.

Treatment : In patients with obstructing carcinoma of the left colon or rectosigmoid junction , immediate resection should be considered. The contraindications to immediate resection include

1. Advanced disease
2. Moribund patient
3. Inexperienced surgeon

Removal of the primary tumour and its draining locoregional lymphnodes is the ideal treatment. In emergency laparotomy , when a removable lesion is found in the caecum, ascending colon, hepatic flexure an emergency right hemicolectomy should be performed. If the lesion is irremovable a proximal stoma or ileotransverse anastomosis should be considered.

Obstructing lesions at the splenic flexure should be treated with extended right hemicolectomy with ileodecending colonic anastomosis.

It is safe to bring the proximal colon to the surface as a colostomy. When possible the distal bowel should be brought out at the same time (Paul Mikulicz procedure) to facilitate subsequent extraperitoneal closure. In majority of cases the

distal bowel is closed and returned to the abdomen (Hartmann's procedure) A second stage colorectal anastomosis can be planned , when the patient is fit.

If an anastomosis is to be considered using the proximal colon in the presence of obstruction, it must be decompressed and cleaned by an on table colonic lavage. The anastomosis should also be protected with a covering stoma.

Endoscopic decompression of the acute colonic obstruction followed by definitive one stage surgery has been described .Laser canalization of the advanced large bowel tumors have been reported

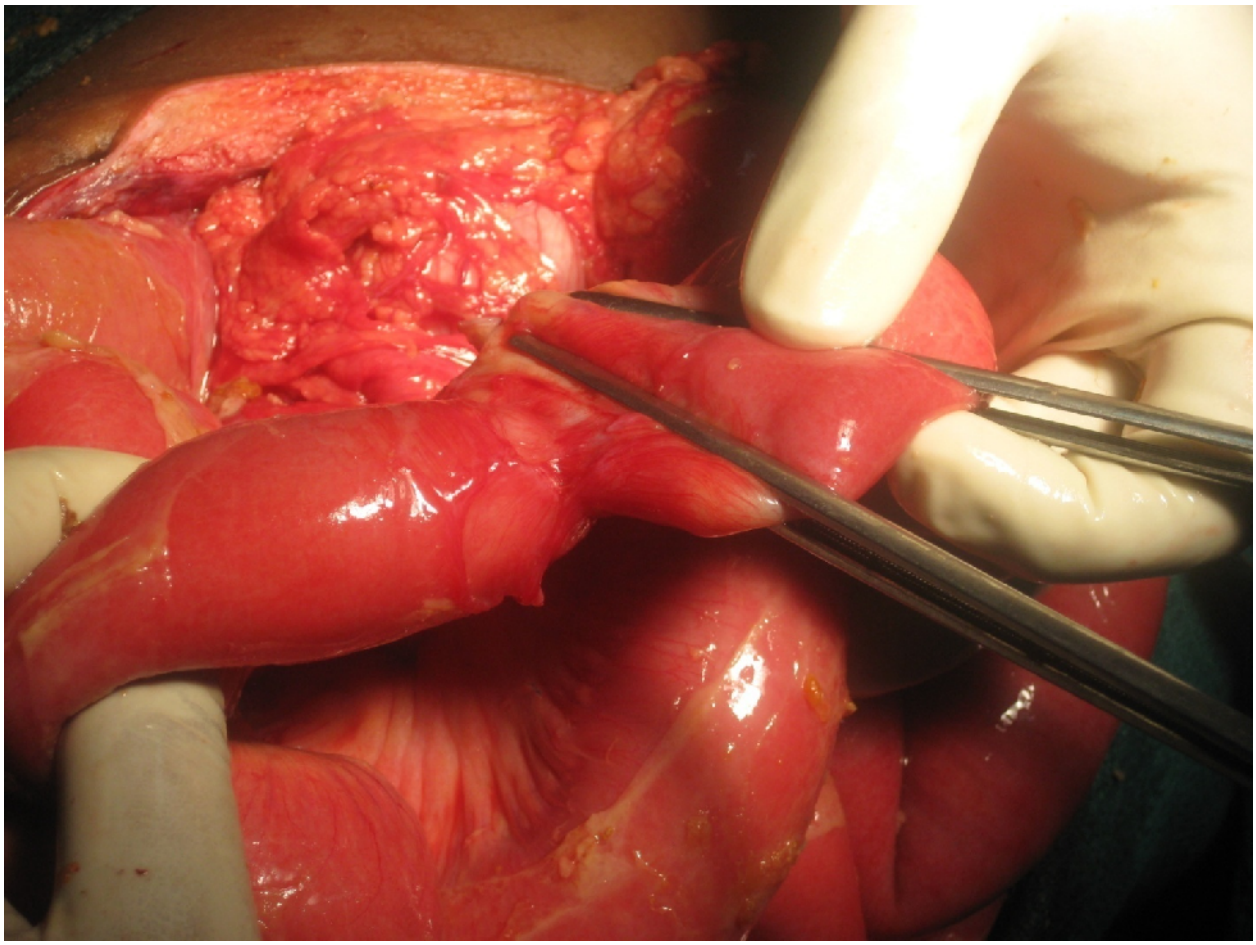
OBSTRUCTION DUE TO INTERNAL HERNIATION :

Internal herniation occurs within

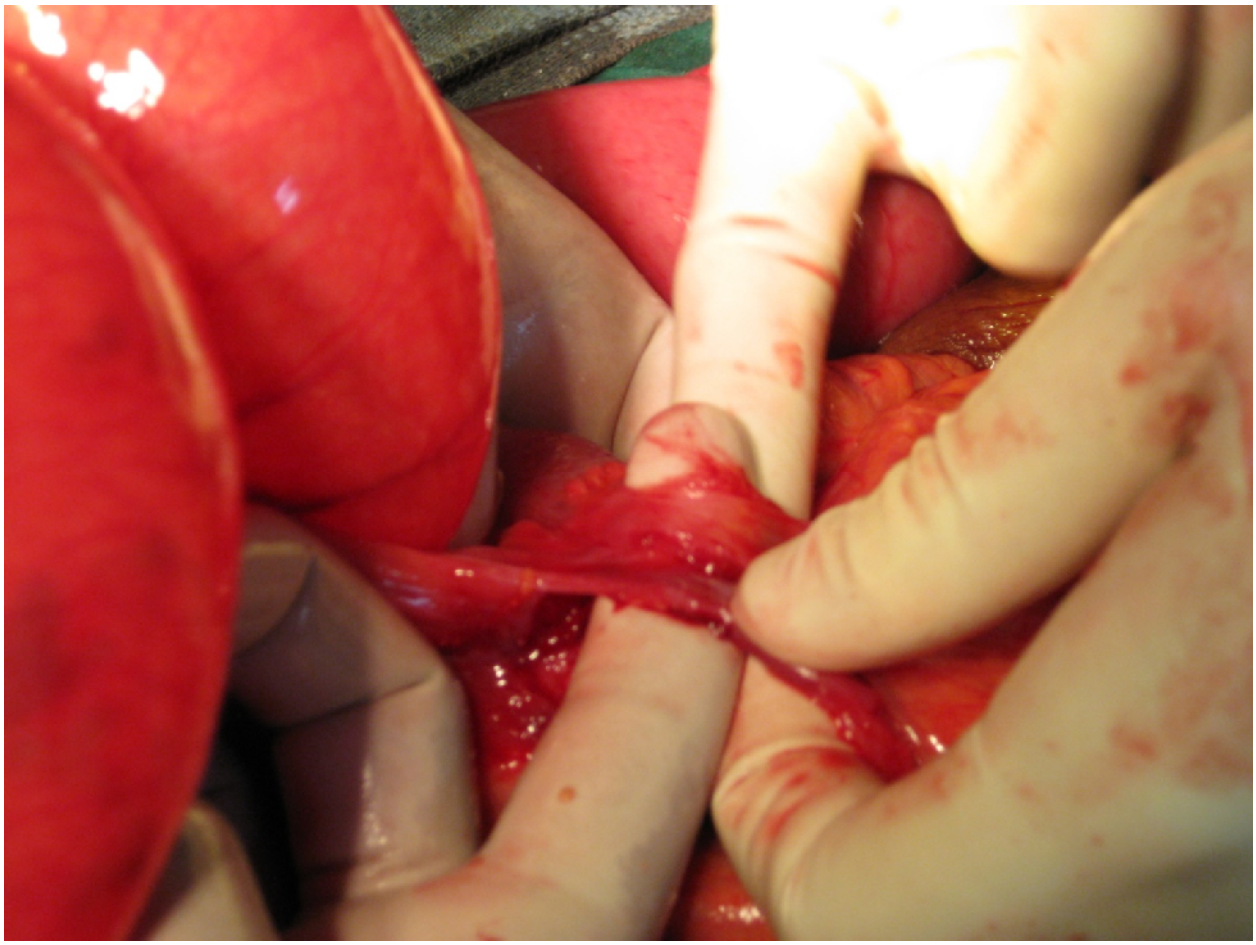
1. the foramen of winslow
2. defects in the mesentry & mesocolon
3. defects in broad ligament
4. congenital or acquired diaphragmatic hernia
5. retroperitoneal hernia fossae

majority of these are asymptomatic and usually an incidental finding at laparotomy. Division of the constricting agent is the correct treatment.

Ileocaecal Tuberculosis



Congenital Bands



RARE CAUSES :

1. bolus obstruction following partial gastrectomy
2. intraluminal foreign bodies
3. prolapsed of bowel through colostomy
4. afferent loop obstruction
5. retrograde jejunogastric intussusception

PARALYTIC ILEUS :

The intestine fails to transmit the peristaltic waves ,and this is due to a failure of the neuromuscular mechanism. The patient presents with abdominal distention effortless vomiting,constipation,tachycardia,and high temperature in cases of septicemia and peritonitis.

The common causes are postoperative , infection and electrolyte imbalance. Postoperative paralytic ileus occurs after any abdominal procedure and is self limiting. It usually exists for 24-72 hours. It may be prolonged in the presence of hypoproteinaemia or metabolic abnormality.

Treatment

Essentially conservative. NG aspiration , IV fluids and correction of electrolytes imbalance. The cause should be removed. If ileus is prolonged and life

threatening , laparotomy should be carried out and the bowel decompressed using a savages sucker

MESENTERIC VASCULAR THROMBOSIS AND EMBOLISM

Can present as intestinal obstruction. Elderly people are most commonly affected. Usually present with abdominal pain, repeated vomiting and passage of blood per rectum. Rigidity and rebound tenderness may be present. A predisposing cause like valvular heart disease may be associated. Superior mesenteric arteriogram can confirm the diagnosis. Treatment is surgical

If the bowel is viable direct vascular surgery like embolectomy or bypass graft can be attempted

However in late stages,resection and end to end anastomosis should be done

INTESTINAL PSEUDOOBSTRUCTION :

The term psedoobstruction is used to describe the obstruction of the small or large intestine in the absence of a mechanical cause or acute intra abdominal disease.

Small bowel pseudoobstruction

1. primary
2. secondary

secondary causes of small bowel psedoobstruction are

1. diabetes
2. scleroderma
3. hypothyroidism
4. drugs like phenothiazine, laxative abuse

ACUTE COLONIC PSEDO OBSTRUCTION : (Ogilvie's syndrome)

Several postulates have been proposed

1. due to disturbance in the autonomic nervous system ,particularly malfunction of sacral parasympathetic nerves(S2-S4) causing descending colon atony, resulting in a functional obstruction
2. numerous intrinsic agents such as secretin, glucagon, epinephrine, anticholinergics precipitate impairment of electrical activity of the intestine as well as a defect in the intestinal motility
3. decreased colonic concentration of VIP is often associated with this condition. The exact pathogenesis of acute colonic psedoobstruction remains unknown.

Clinical features:

Males are frequently involved , common in 6th decade. Pain & distension are most common features. Constipation is common. Tenderness is usually absent in the early stage. Its presence may herald impending perforation. Rectal examination usually reveals empty rectum.

Investigations:

Plain Xray is the most informative. It shows features of distal obstruction and proximal colonic dilatation with little faeces or fluid. The haustral and mucosal pattern is often maintained.

A water soluble contrast enema is the best investigation to rule out mechanical obstruction provided the patient has no evidence of impending perforation.

Management :

Initial management is essentially conservative, which includes nil per oral, NG aspiration, correction of any fluid & electrolyte abnormality

Withdrawal of any opiates or anticholinergics is also important. It is imperative to dignose and treat abdominal sepsis if coexists.

Colonoscopy: colonoscopic decompression is now thought to be the most effective therapeutic modality if the bowel is viable. Successful decompression may be expected in upto 80% of the patients after colonoscopy. Recurrence occurs is upto 15%

Drug therapy : ceruletide, a synthetic decapeptide has been shown to stimulate intestinal motility. Cisapride acts by enhancing the release of acetylcholine in myenteric plexus of gutwall has also been used with some success. However the drugs are not useful in dynamic obstruction.

Surgical management: after failure of colonoscopic decompression or when caecal tenderness is present. Percutaneous caecostomy under CT guidance have been done successfully as an alternative to surgical caecostomy for decompressing massively dilated caecum.

If there are signs of perforation or gangrene, laparotomy must be undertaken. Excision of gangrenous colon with exteriorization of bowel ends with delayed anastomosis is carried.

Outcome : pseudoobstruction is usually relieved in 3-7 days. Patients undergoing conservative treatment have a mortality rate of 10-15 %

CONCLUSION

In our study the most common cause of intestinal obstruction was obstructed / incarcerated inguinal hernia. Though adhesive obstruction forms the most common form of intestinal obstruction in the literature, in our study obstructed / incarcerated inguinal hernia forms the major cause (46%)

The second common cause was sigmoid volvulus (18%) followed by tumors which forms 14% Adhesive intestinal obstruction contributes only 10% of our study. Most of the patients with adhesions were managed conservatively and they didn't contribute to the study group.

Out of 23 cases of , 16 inguinal hernia were obstructed and 7 strangulated. The patients with obstructed inguinal hernias were treated by obstruction release with hernia repair. In strangulated hernias as the bowel viability was lost the gangrenous part of the intestine was resected and end to end anastomosis done. The procedure was followed by henia repair.

In patients who presented with sigmoid volvulus , all the 9 cases underwent resection anastomosis, since the bowel was not viable or there was doubtful viability. Defunctioning colostomy also done to protect the anastomotic area, as the bowel was unprepared and heavily loaded with fecal matter.

In patients who presented with malignant growth we did loop colostomy as a temporary measure to relieve the obstructive symptoms. Patients who were fit for a second stage procedure undergone resection of the tumor after a good bowel preparation . They were referred to higher institution for the follow up of chemo and radiotherapy. The patients with advanced disease or unresectable growths were treated with permanent colostomy.

The patients who presented with ileocaecal Tb, mesenteric vascular ischemia, intussusception, and small bowel volvulus under went resection of the affected part of the bowel followed by end to end anastomosis .

The Male to Female ratio was 4:1(39 males & 11 females)

The most common age group affected was 41-50 years

Abdominal pain was the most common symptom followed by abdominal distension. Constipation and vomiting are almost equal in frequency.

The commonest postoperative complication was wound infection

The mortality in our study was 4% One patient with mesenteric vascular ischemia and extensive bowel gangrene died of anastomotic leakage and sepsis . The other patient who underwent colostomy for rectosigmoid growth died

on 4th POD . The cause of death was acute myocardial infarction. The remaining cases were being followed up and the post op period was uneventful.

***Table No* : 1**

CAUSES OF INTESTINAL OBSTRUCTION.

S.no	Causes	Male	Female	Total
1.	Adhesive Intestinal Obstruction	3	2	5
2.	Obstructed Hernia	20	3	23
3.	Sigmoid volvulus	7	2	9
4.	Tumors	4	3	7
5.	Ileo caecal TB	2	-	2
6.	Mesenteric Vascular Ischemia	2	-	2
7.	Intussusception/ small bowel volvulus	1	1	2
	Total	39	11	50

CAUSES OF INTESTINAL OBSTRUCTION

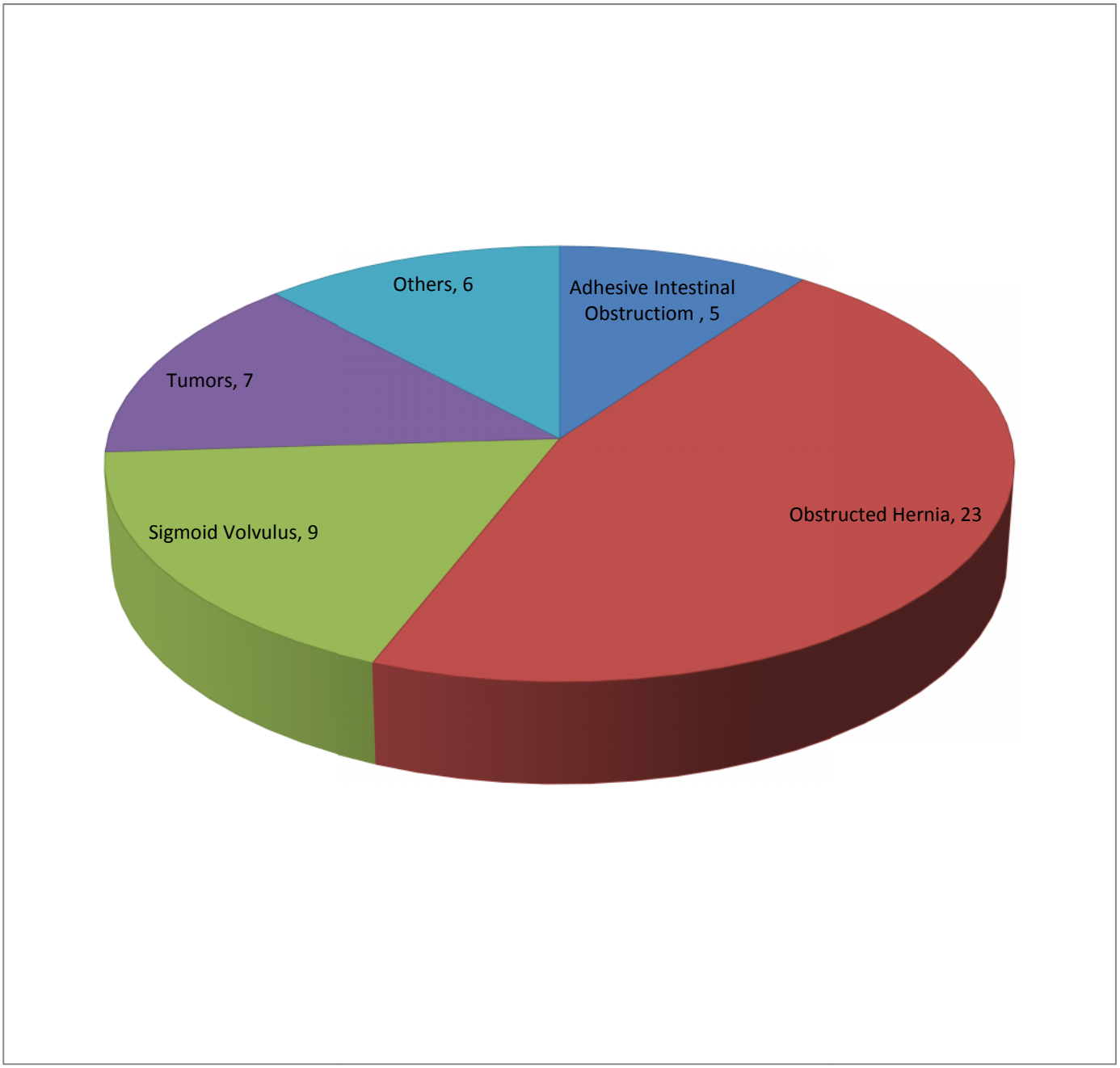


***Table No* : 2**

SYMPTOMS DISTRIBUTION

Symptoms	No. of patients	Percentage
1. Abdominal pain	50	100%
2. Vomiting	33	66%
3. Abdominal distension	47	94%
4. Constipation	34	68%

Symptoms - Percentage

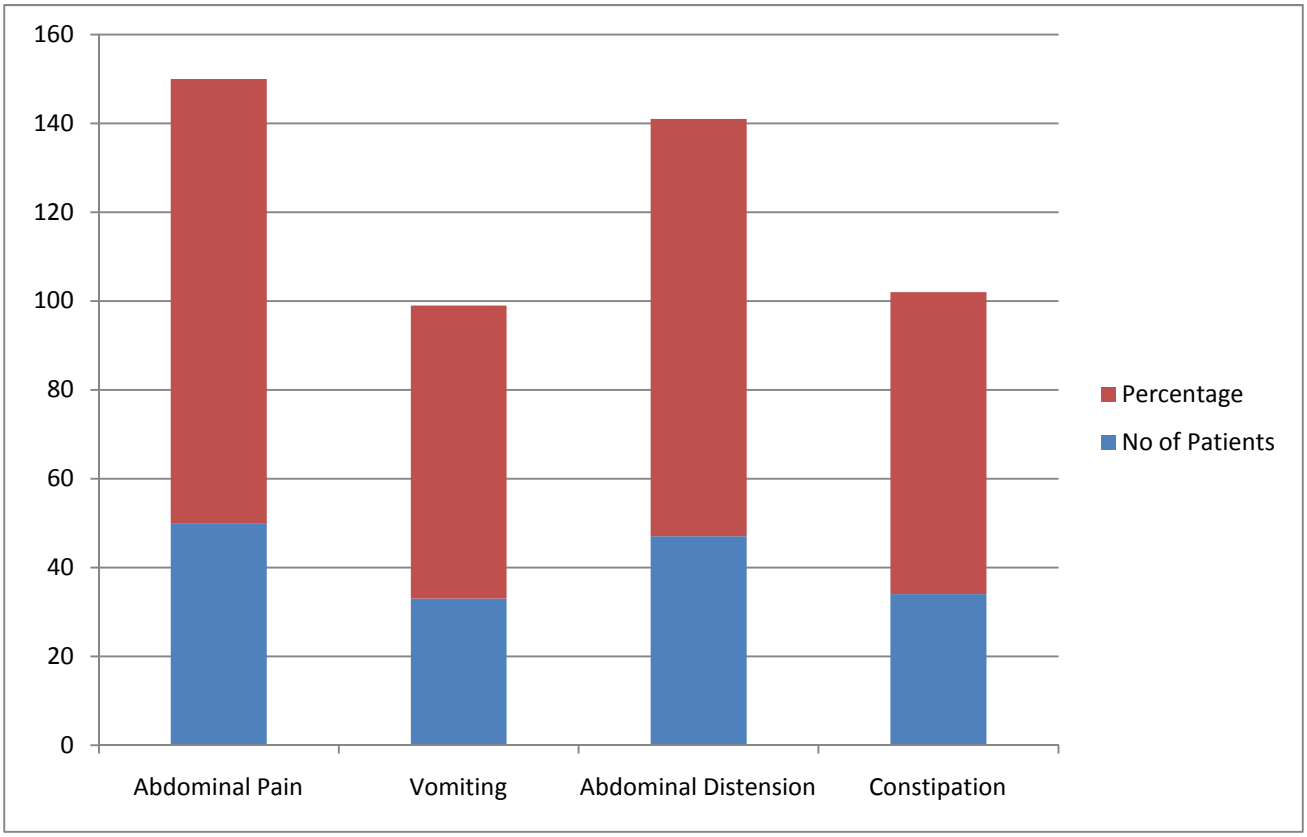


***Table No* : 3**

AGE SEX DISTRIBUTION

Age group	Male	Female	Percentage
<20	1	0	2%
21-30	3	1	8%
31-40	9	3	24%
41-50	12	4	32%
51-60	9	2	22%
61-70	4	1	10%
>70	1	0	2%
Total	39	11	100%

Male : female = 78:22

Mean age is = 45

AGE SEX DISTRIBUTION

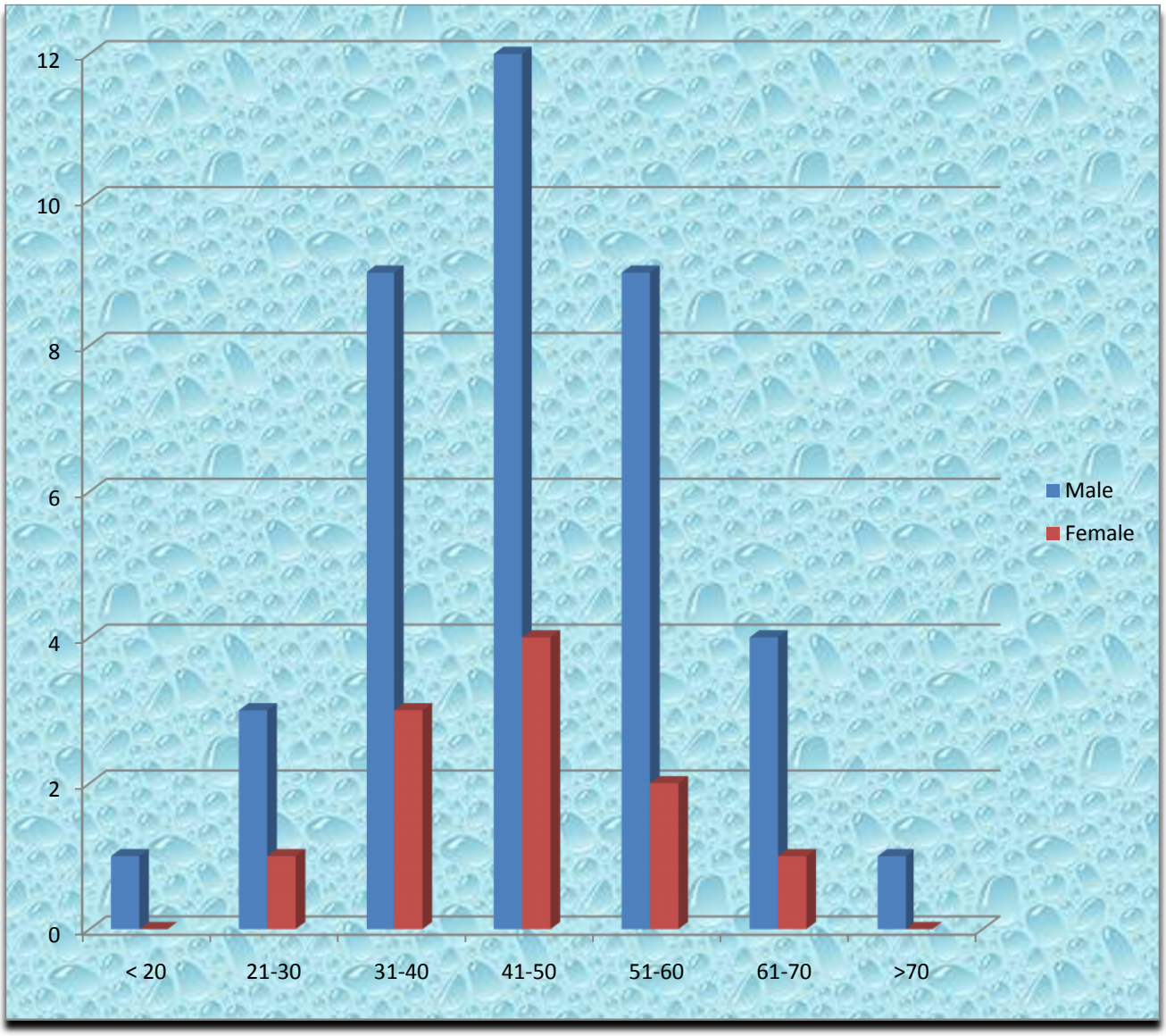


Table No : 4

TREATMENT

S.No	Diagnosis	No. of Cases	Surgery done
1	**Hernia**		
	Obstructed	16	Obstruction release Hernia repair
	strangulated	7	Resection anast , Hernia repair
2	Volvulus	9	Resection anastomosis, defunctioning colostomy
3	Tumors	7	colostomy
4	Adhesions	5	Adhesiolysis
5	Ileocaecal Tb	2	Limited resection anastomosis
6	Mesenteric vascular ischemia	2	Resection anastomosis
7	Intussusception	1	Resection anastomosis
8	Small bowel volvulus	2	Resection anastomosis

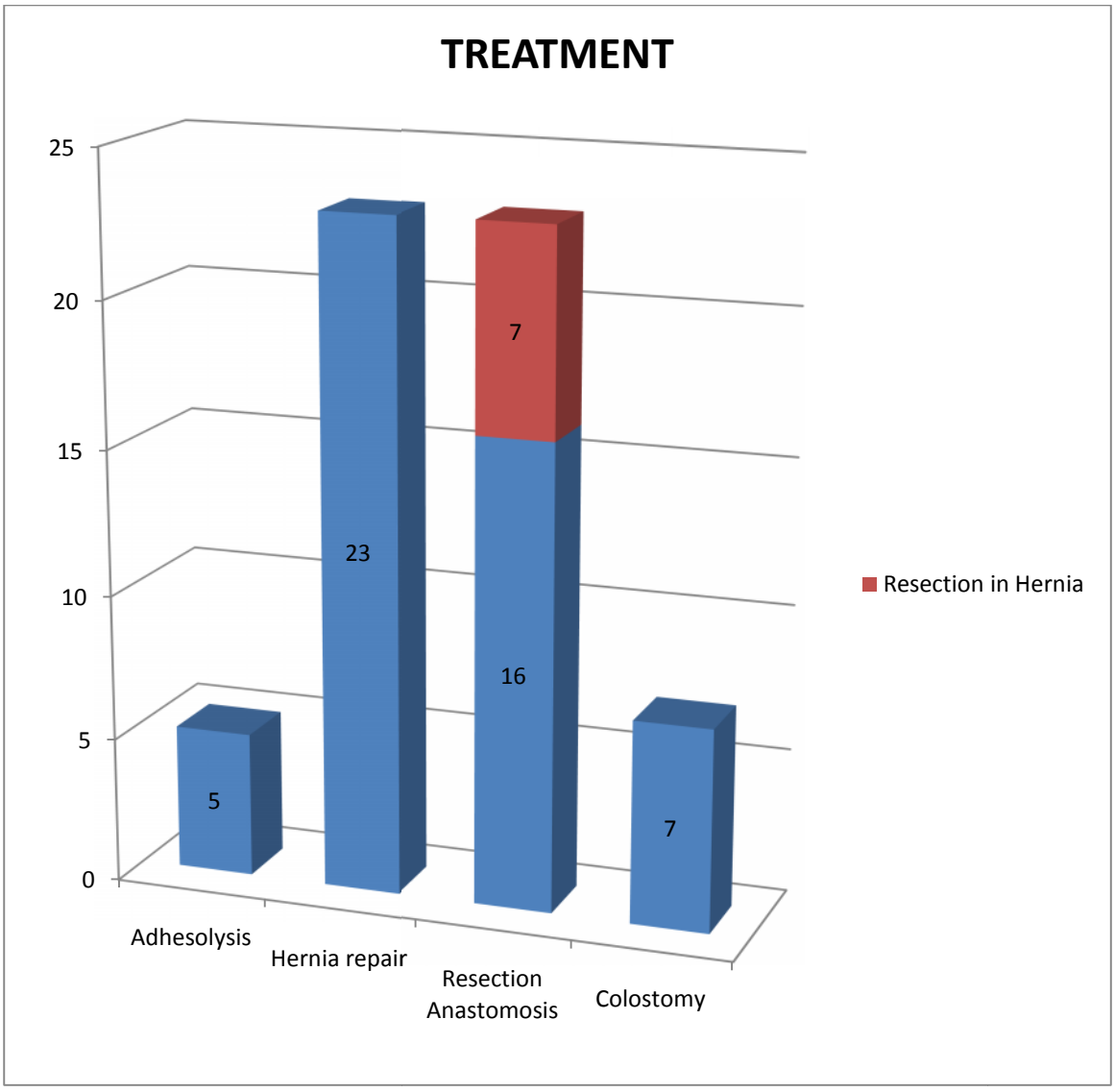
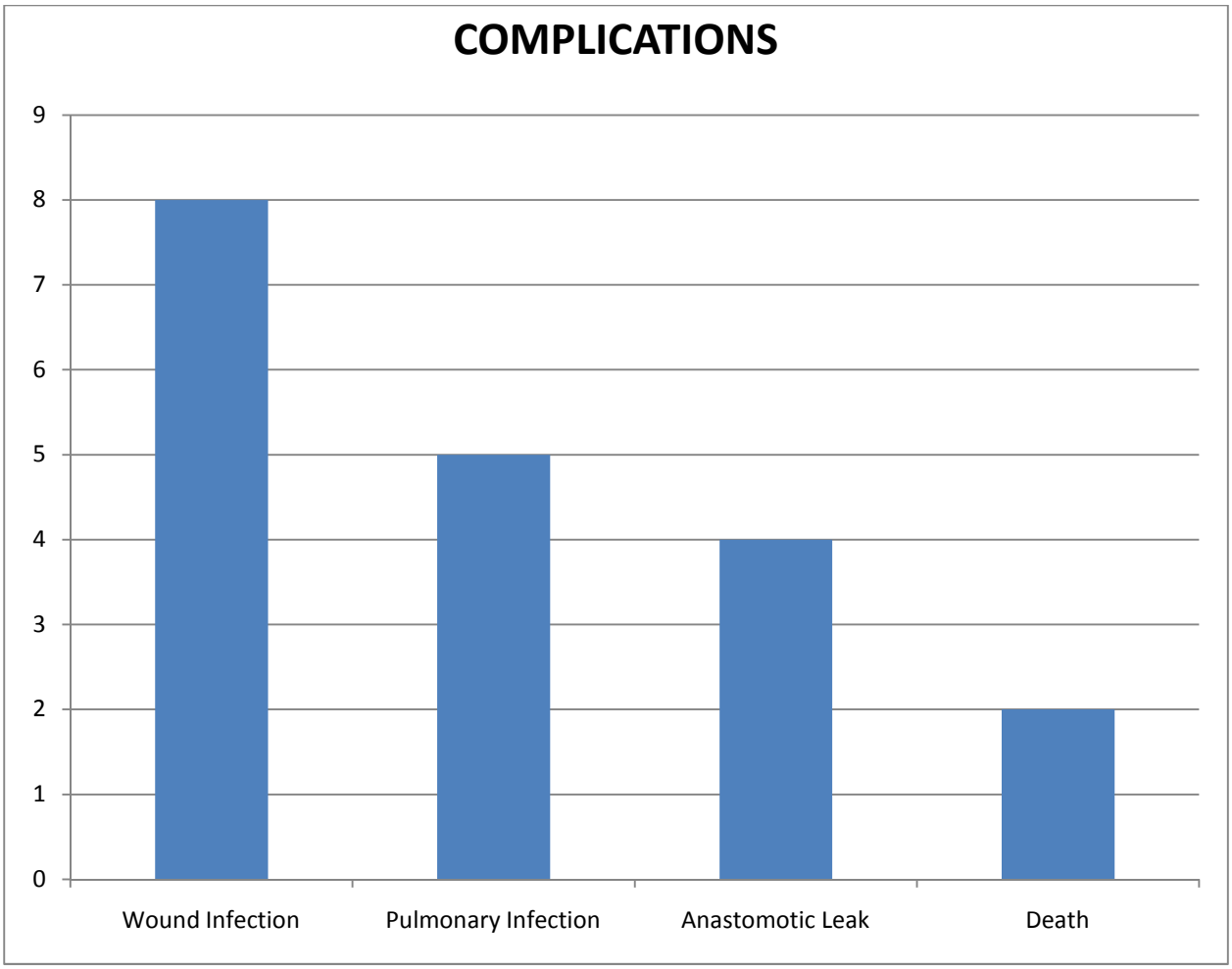

TREATMENT
25
20
15
10
5
0
5
23
16
7
7
Adhesolysis
Hernia repair
Resection Anastomosis
Colostomy
Resection in Hernia

***Table No* :5**

COMPLICATIONS

Wound infection	8
Pulmonary infection	5
Anastomotic leak	4
Death	2


COMPLICATIONS
9
8
7
6
5
4
3
2
1
0
Wound Infection
Pulmonary Infection
Anastomotic Leak
Death

CASE PROFORMA

Name : Age : Sex

Address: Occupation

I.P no. :

D.O.A : D.O.S : D.O.D :

Diagnosis :

Surgery Done:

Outcomes Studied:

S.No	Symptoms / Signs	Whether present
1.	Abdominal pain	
2.	Vomiting	
3.	Abdominal distension	
4.	Constipation	
5.	Tenderness	
6.	Guarding & Rigidity	
7.	Bowel sounds	
8.	Complications	
	i)wound infection	
	ii)anas.leak/fistula	
	iii)pulmonary infection	
	iv)death	

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S.No	Name	Age/ Sex	I.P No	Abd Pain	Vomiting	Abd distension	Constipation	Visible peristal	Bowel sounds	Radiology	Diagnosis	Procedure
1	Sivaraman	36 M		+	+	+	-	+	Exagg erated	Air fluid levels	Obstruted.ing hernia	obstruction release herniorraphy
2	Nagaraj	65 M		+	-	+	+	-	absent	Dilated bowel	Rectosigmoid growth	colostomy
3	Krishnaveni	35 F		+	+	+	-	+	Exagge rated	Air fluid levels	Obstructed fem.hernia	Resection anastomosis
4	Thambiran	48 M		+	+	+	+	+	Exagge rated	Air fluid levels	Obstucted.ing hernia	obstruction release herniorraphy
5	Ravi	45 M		+	+	-	-	-	-	Dilated bowel	Ileocaecal Tb	Resection anastomosis
6	Vinayagamoorthi	60 M		+	-	+	+	-	-	Coffee bean	Sigmoid volvulus	Resection anastomosis
7	Elumalai	60 M		+	+	+	-	+	Exagg erated	Air fluid levels	Obstucted.ing hernia	obstruction release herniorraphy
8	Kaniammal	60 F		+	-	+	+	-	-	Dilated bowel -	Sigmoid volvulus	Resection Anastomosis defunc.colostomy
9	Balaraman	40 M		+	+	-	+	-	-	Dilated bowel	Ileocaecal Tb	Resection anastomosis
10	Manoharan	55 M		+	+	+	+	+	Exagg erated	Air fluid levels	Obstucted.ing hernia	obstruction release herniorraphy
11	Sokammal	52 M		+	+	+	+	+	Exagg erated	Air fluid levels	Strangulated fem.hernia	Resection anastomosis
12	Shanmugam	40 M		+	+	+	+	+	Exagg erated	Air fluid levels	Obstucted.ing hernia	obstruction release herniorraphy
13	Mani	36 M		+	+	+	-	-	Exagg erated	Dilated Bowel	Adhesive obstuction	adhesiolysis
14	Saravanan	23 M		+	+	+	-	+	Exagg erated	Air fluid levels	Obstucted.ing hernia	obstruction release herniorraphy
15	Loganathan	40 M		+	+	+	+	+	-	Air fluid levels	Strangulated Ing.hernia	Resection Anast,hernia repair
16	Muthulakshmi	45 F		+	-	+	+	-	-	Dilated bowel	Rectosigmoid growth	Colostomy
17	Subramani	72 M		+	+	+	-	+	Exagg	Air fluid	Obstucted.ing	obstruction release

									erated	levels	hernia	herniorraphy
18	Egambaram	67 M		+	-	+	+	-	-	Coffee bean	Sigmoid volvulus	Hartmanns procedure
19	Rajendran	40 M		+	+	+	-	+	Exagg erated	Air fluid levels	Strang.ing hernia	Resection anast. herniorraphy
20	Amutha	33 F		+	+	+	+	+	Exagg erated	Dilated bowel	Ileocolic intussuception	Resection Anastomosis
21	Murugesan	42 M		+	+	+	+	+	Exagg erated	Air fluid levels	Obstucted.ing hernia	obstruction release herniorraphy
22	Damodaran	30 M		+	-	-	+	-	-	-	Mesenteric vasc .Ischemia	Resection Anastomosis
23	Subramani	60 M		+	-	+	+	-	-	Dilated bowel	Sigmoid volvulus	Resection Anastomosis defunc.colostomy
24	Sabapathi	65 M		+	+	+	-	+	Exagg erated	Air fluid levels	Obstucted.ing hernia	obstruction release herniorraphy
25	Elumalai	60 M		+	+	+	+	+	Exagg erated	Air fluid levels	Stangulated.ing hernia	Resection anast. herniorraphy
26	Allagammal	45 F		+	+	+	+	-	Exagg erated	Multiple fluidlevel	Adhesive obstuction	adhesiolysis
27	Karthikeyan	43 M		+	+	+	+	+	Exagg erated	Air fluid levels	Obstucted.ing hernia	obstruction release herniorraphy
28	Srinivasan	50 M		+	+	+	+	+	Exagg erated	Air fluid levels	Obstucted.ing hernia	obstruction release herniorraphy
29	Ellappan	45 M		+	-	+	-	-	-	-	Mesenteric vasc .Ischemia	Resection Anastomosis
30	Chinnaponnu	31 F		+	-	+	+	-	-	Dilated bowel	Rectosigmoid growth	Colostomy
31	kannan	62 M		+	-	+	+	-	-	Coffee bean	Sigmoid volvulus	Resection Anastomosis defunc.colostomy
32	Rajendran	44 M		+	+	+	-	+	Exagg erated	Air fluid levels	Stangulated.ing hernia	Resection anast. herniorraphy
33	Durairaj	32 M		+	+	+	+	-	Exagg erated	Multiple fluidlevel	Adhesive obstuction	adhesiolysis
34	Panchavarnam	45 F		+	-	+	+	-	-	Dilated bowel	Sigmoid volvulus	Resection Anastomosis

												defunc.colostomy
35	Moorthi	37 M		+	+	+	+	+	Exagg erated	Air fluid levels	Obstucted.ing hernia	obstruction release herniorraphy
36	Velmurugan	44 M		+	-	+	+	-	-		Ca. Rectum	colostomy
37	Kasi	60 M		+	-	+	+	-	-	Coffee bean	Sigmoid volvulus	Resection Anastomosis defunc.colostomy
38	Elumalai	60 M		+	-	+	+	-	-		Ca Anal canal	colostomy
39	Panner selvam	30 M		+	+	+	-	+	Exagg erated	Air fluid levels	Stangulated.ing hernia	Resection anast. herniorraphy
40	Ganesan	54 M		+	+	+	+	-	-	Dilated bowel	Sigmoid volvulus	Resection Anastomosis
41	Arivazhagan	42 M		+	+	+	-	+	Exagg erated	Air fluid levels	Obstucted.ing hernia	obstruction release herniorraphy
42	Mariappan	31 M		+	+	+	-	-	Exagg erated	Multiple fluidlevel	Adhesive obstuction	adhesiolysis
43	kumaresan	44 M		+	+	+	+	+	Exagg erated	Air fluid levels	Obstucted.ing hernia	obstruction release herniorraphy
44	Rajeswari	62 F		+	-	+	+	-	-	Coffee bean	Sigmoid volvulus	Resection Anastomosis defunc.colostomy
45	Murugan	56 M		+	-	+	+	-	-	Dilated bowel	Rectosigmoid growth	colostomy
46	Akila	24 F		+	+	+	-	+	Exagg erated	Multiple fluidlevel	Adhesive obstuction	adhesiolysis
47	Gomathi	48 F		+	+	+	+	+	Exagg erated	Air fluid levels	Stangulated.ing hernia	Resection anast. Herniorraphy
48	Kaniyammal	18 F		+	+	+	+	+	Exagg erated		Smallintestinal volvulus	Resection Anastomosis
49	Ramanathan	50 M		+	-	+	+	-	-	Dilated bowel	Ca. Rectum	Colostomy
50	Gurumoorthi	56 M		+	+	+	-	+	Exagg erated	Air fluid levels	Obstucted.ing hernia	obstruction release herniorraphy